

CHAPTER V

CONCLUSION

The commercial quality of PMMA sheets was studied and investigated from 2 factors: initiator concentration and polymerization temperature. In the two-step isothermal process, the time at which the sample prepared at each polymerization condition was removed from the polymerization step was determined from the information obtained from the one-step isothermal process (i.e., temperature profile and the percentage of monomer conversion curve). The results obtained from overlay plot of temperature profile and the percentage of monomer conversion curve indicated that the optimal reaction time could be obtained quite precisely from the information obtained from the temperature profile alone (viz. taken as the time at the end of each exothermic peak).

Based on the mechanical properties and appearance of the samples obtained, it was shown on illustrated that samples polymerized in the two-step isothermal process were better than those polymerized in the one-step isothermal process, a contribution from the much higher maximum percentage of monomer conversion. Among the conditions studied for the two-step isothermal process, the optimal condition for producing PMMA sheets with reasonable total reaction time, mechanical properties, and appearance was 65-105°C (for water-air system, the total reaction time for which was ca. 150 minutes) and 63-105°C (for air-air system, the total reaction for which was ca. 180 minutes) at a fixed initiator concentration of 0.038% ADVN.